NETGEAR

XAV1601 Powerline AV+ 200 Nano

User Manual

350 East Plumeria Drive
San Jose, CA 95134
USA

August 2011
202-10867-02
v1.0

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Revision History

Publication Part Number	Version	Publish Date	Comments
202-10867-02	v1.0	August 2011	First publication

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Installation and Basic Configuration

1

This chapter describes how to install and configure the XAV1601 Powerline AV+ 200 Nano. It also explains the security features and how to customize the encryption key for added security.

How the XAV1601 Fits in Your Network

You can use one or more Powerline XAV1601 Nano adapters to extend your Ethernet network anywhere in your house using your existing electrical power lines. following illustration shows an existing Powerline network with one Powerline device Room 1, and second Powerline device added in Room 2:

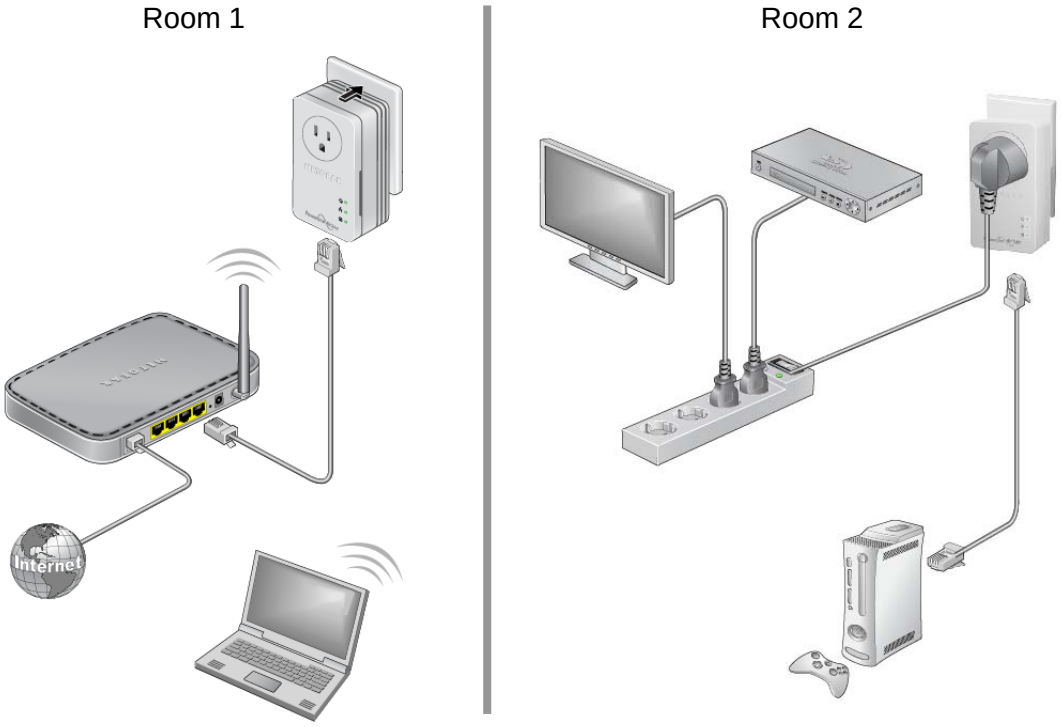


Figure 1. Powerline Adapter Connected to an Ethernet Network

Powerline XAV1601 Nano Features

The following illustration shows the front and bottom panels of the XAV1601:

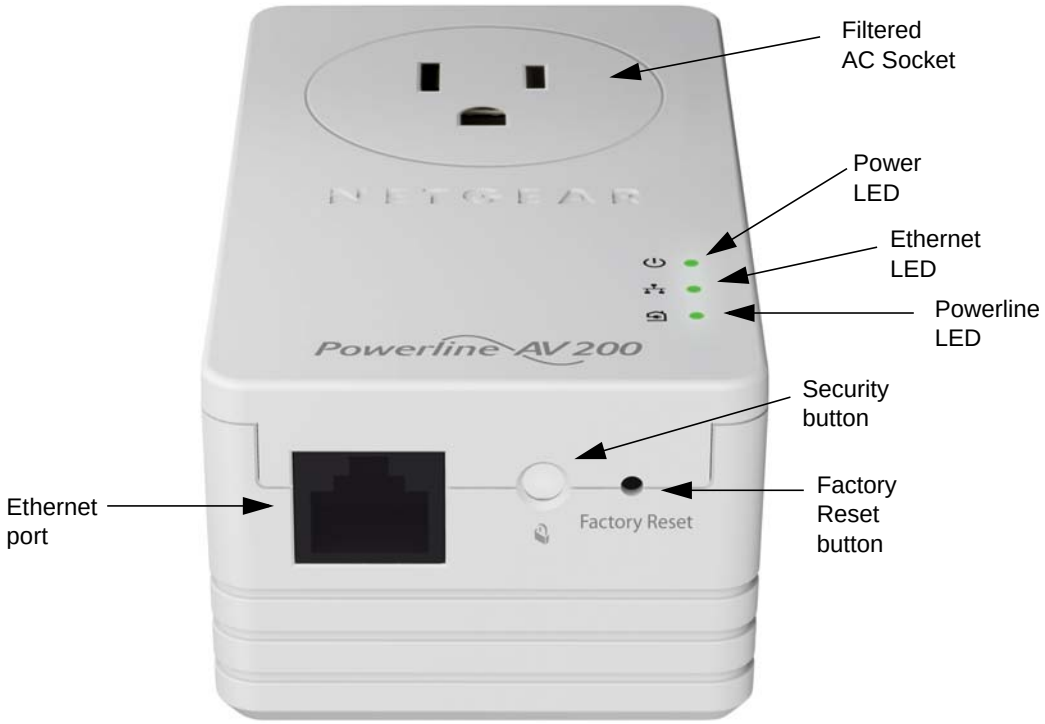


Figure 2. XAV1601 Powerline AV+ 200 Nano

XAV1601 Product Label

The product label on the rear panel of the XAV1601 contains the items listed below:

- Model number
- MAC address
- Device password
- Serial number

LED and Feature Descriptions

The following table describes the buttons, status LEDs, and Ethernet port on the XAV1601 Powerline AV+ 200 Nano.

Table 1. Model Number Feature Descriptions

Table 2.

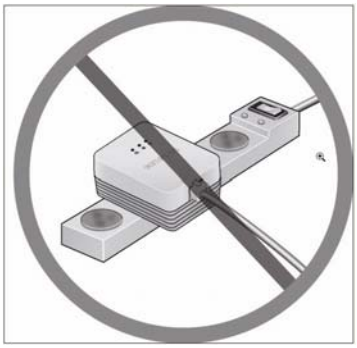
<table>
<tr><th>Item</th><th colspan="3">Description</th></tr>
<tr><td>Power LED </td><td colspan="3">• Solid green. The electrical power is on.
• Blinking green.The adapter is in the process of restarting or setting up security.
• Amber. Power saving mode. The unit enters power saving mode if the Ethernet port is not linked for more than 10 minutes.
• Off. There is no electrical power, or has been turned off through the Powerline utility.</td></tr>
<tr><td rowspan="3">Powerline LED </td><td colspan="3">• Solid. The adapter is connected to a Powerline network.
• Blinking. The adapter is sending or receiving data.
• Off. The adapter has not found any other compatible Powerline devices using the same encryption key, or has been turned off through the Powerline utility.</td></tr>
<tr><td colspan="3">The Pick A Plug feature lets you pick the electrical outlet with the strongest link rate, indicated by the color displayed by the LED:</td></tr>
<tr><td>Green: Link rate > 80 Mbps (Best) - Good for HD video</td><td>Amber: Link rate >50, < 80 Mbps (Better) - Good for SD Video</td><td>Red: Link rate < 50 Mbps (Good) - Good for data</td></tr>
<tr><td>Ethernet LED </td><td colspan="3">• Solid. The Ethernet port is linked, but there is no activity.
• Blinking. There is traffic on the Ethernet port.
• Off. There is no Ethernet connection, or it has been turned off through the Powerline utility.</td></tr>
<tr><td>Factory Reset</td><td colspan="3">Press the Factory Reset button for 1 second, then release to return the Powerline adapter to its factory default settings.</td></tr>
<tr><td>Security Button</td><td colspan="3">If you set security on your other adapters, after you plug your new AV adapter into the wall socket, press its security button for 2 seconds; then press the Security button on any adapter in your existing network for 2 seconds. Both buttons must be pressed within 2 minutes.
Note: The Security button does not work in power saving mode. The unit enters power saving mode if the Ethernet port is not linked for more than 10 minutes.</td></tr>
<tr><td>Ethernet Port</td><td colspan="3">Plug one end of the Ethernet cable that comes with the XAV1601 Powerline AV+ 200 Nano into this port and the other end either into your router, or into the computer or other peripheral devices.</td></tr>
</table>

Installing Your Powerline XAV1601 Nano

Prepare for Installation:

1. Before you begin, verify the following:
   - Your Ethernet network is set up.
   - An Ethernet port is available on your router.
   - Your Internet connection is working.
   - An Ethernet port is available on each computer that will use a Powerline XAV1601 Nano and is configured to work on your network. Usually, the default configuration settings (TCP/IP and DHCP) are fine.
2. Familiarize yourself with the Powerline XAV1601 Nano.

   The front panel has three lights: Power, Powerline, and Ethernet. The side panel has a Security button, and a Reset button. The Ethernet port is located on the bottom of the adapter. See *Figure 2* on page 5.
3. Plan the location of your Powerline devices:
   - Use an electrical outlet that is not controlled by a wall switch to avoid someone unknowingly turning off the power to the outlet.
   - Do not connect the Powerline XAV1601 Nano to a power strip, extension cord, or surge protector as this might prevent it from working correctly, or reduce the network performance.
   - Avoid using the Powerline XAV1601 Nano in an electrical outlet that is located near an appliance that uses a lot of power, such as a washer or dryer, or a refrigerator. This could potentially prevent the adapter from working correctly, or reduce network performance.



Connecting a Powerline AV+ 200 Nano to the Router

1. Plug an XAV1601 into a power outlet near your router.

   Use the supplied gray Ethernet cable to connect from the XAV1601 to a LAN port on your router so that the Powerline network can gain access to the Internet. The Power and Ethernet LEDs on the Powerline XAV1601 Nano should turn on.

Note: It is *not* necessary to disconnect your router from your computer.

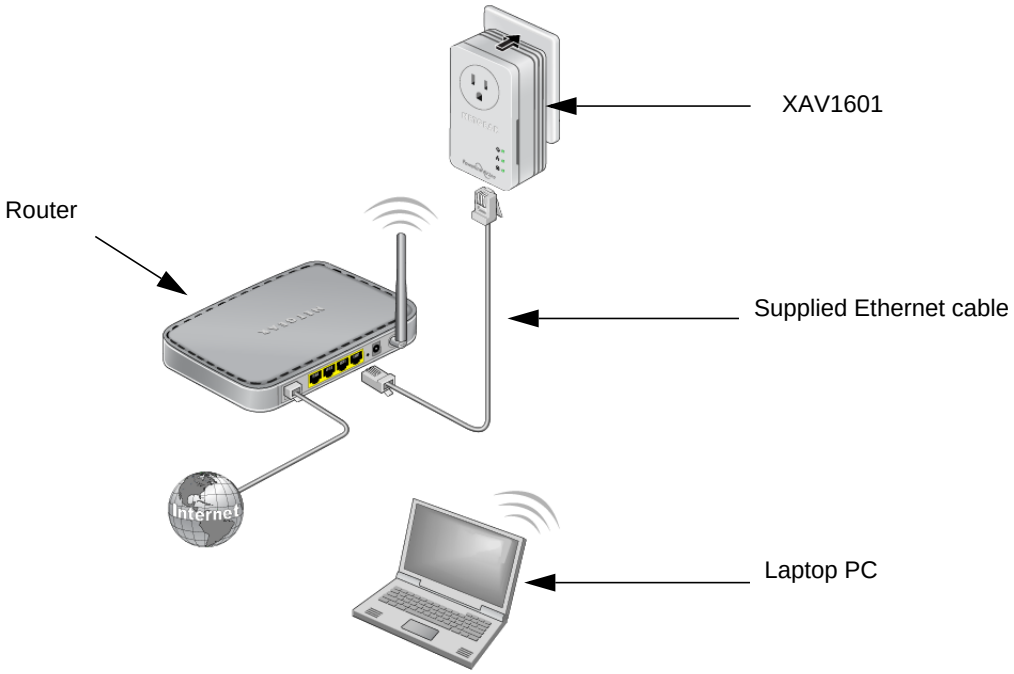


Figure 3. Connecting the XAV1601 to a Router

2. Once the Powerline adapter is plugged in and power is first applied, check to see that the Power LED is on.
3. After approximately 10 seconds, check to see that:
   a. The Power LED is solid green.
   b. The Powerline LED is lit.
   c. The Ethernet LED is on or blinks.

Adding Adapters to Your Network

Once the first adapter is installed and connected to your router, you can easily add adapters into your network.

To add Powerline adapters:

1. Be sure the first Powerline adapter is connected to your router.
2. Plug additional Powerline adapters into power outlets near the other computers and additional peripheral devices to be included in your Powerline network.
3. Use the gray Ethernet cable from the XAV1601 package to connect from the Powerline adapter to an Ethernet port located on the other computer or peripheral device.
4. Wait for each Powerline adapter to be recognized by the Powerline network.

   The Power, Ethernet, and Powerline LEDs should turn on. This could take as little as 5 seconds, or up to 80 seconds. For details about how the LEDs work, see *Table 1* on page 6.
5. Test to make sure that each computer connected to a Powerline XAV1601 Nano can access the Powerline network.

   For example, be sure that you can access the Internet from a remote computer.

   One way to test this is to install the Powerline utility and use it to view all the computers connected by the Powerline AV Ethernet adapter.

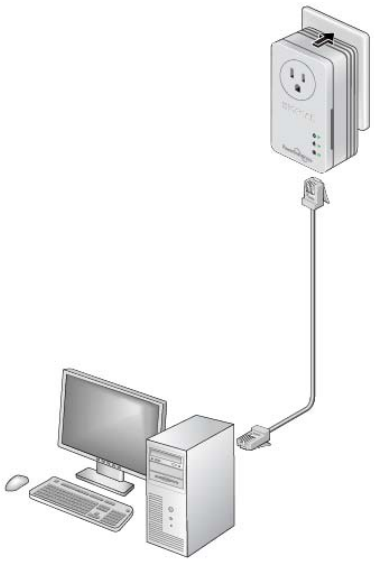


Figure 4. Add an adapter

CAUTION:

NETGEAR recommends that you secure your Powerline network from unauthorized access. This is especially relevant in settings such as apartment buildings. See *Understanding Powerline Network Security* on page 10.

Understanding Powerline Network Security

A Powerline network consists of two or more Powerline adapters using the same network encryption key. Securing your network is crucial. By encrypting the information you send over the Powerline XAV1601 Nano, you help to keep it secure from hackers. If you do not set up security on your network, anyone nearby with a Powerline network can potentially use their connection to gain access to your network and information you send over the Internet. This is especially relevant in settings such as apartment buildings, office buildings, dorm rooms, and other more populated areas.

Powerline devices connected to the same network must use an identical encryption key. The security used by Powerline XAV1601 Nanos is similar to the SSID and encryption keys used in wireless networks, but you do not need software to configure Powerline XAV1601 Nanos.

There are two ways to secure your Powerline network.

- Use the **Security** button located on the Powerline adapter to automatically generate a random encryption key. See *Set the Encryption Key* .
- Use the XAV1601 Powerline Utility to configure your Powerline network with an encryption key that you specify. If you are already using Powerline or HomePlug devices then you will need to use the Powerline Utility. If not already installed, the Powerline Utility should be installed on your computer. See *Installing the Powerline Utility* on page 12.

  For information about using the XAV1601 Powerline Utility to configure Powerline security or to prioritize Powerline network traffic using the Quality of Service (QoS) feature, see *Chapter 2*.

Note: To return the XAV1601 Powerline AV+ 200 Nano to its factory default settings, see *Reset a Device to Factory Settings* on page 17.

Set the Encryption Key

You can use the **Security** button to change the default encryption key and set a private encryption key instead. The default encryption key is **HomePlugAV**.

Note: Before you change the Encryption key, you need to install the Powerline adapters and get them up and running. Otherwise, they might not be able to communicate with each other.

To set a private encryption key:

1. Verify that all the Powerline XAV1601 Nanos to be configured are plugged in to an electrical outlet.

2. On the first Powerline XAV1601 Nano, press its **Security** button for 2 seconds.

   The power LED starts blinking after you release the button.

   The adapter automatically produces a new, randomly generated network encryption key that each Powerline XAV1601 Nano will use.

   At this point, the other adapters in your network cannot communicate with each other.

3. Within 2 minutes of pressing the **Security** button on the first adapter, press the **Security** button on the second adapter for 2 seconds.

   In order to pair the devices, both buttons must be pressed within 2 minutes.

   This securely configures your Powerline network with the same network encryption key.

4. If your network has more than 2 adapters, press the **Security** button on the additional adapter for 2 seconds, then push the **Security** button on any additional adapters in your existing network for 2 seconds. Both buttons must be pressed within 2 minutes. The adapters retain security settings even if they are unplugged.

Note: An adapter can generate a private encryption key only once. To start over, first reset the adapter back to its factory defaults, then follow the previous procedure. See *Reset a Device to Factory Settings* on page 18.

Using the XAV1601 Powerline Utility

2

This chapter explains how to install and use the XAV1601 Powerline Utility. The Powerline Utility works with all Powerline AV products. The models XAV101, XAV101v2, XAV1004, XAV1501, XAV2001, XAV2501, XAVN2001, XAV5001, XAV5004, XAV5501, and XAV5601 are compatible and can share the same powerline network.

Use the NETGEAR Powerline Utility to:

- Configure encryption for your Powerline network
- Perform diagnostics and monitor performance
- Set quality of service (QoS) features to prioritize Powerline network traffic
- Reset adapters to factory default settings

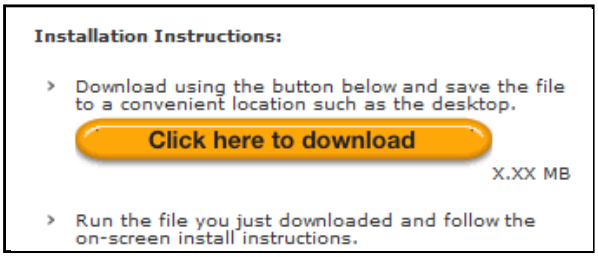
Installing the Powerline Utility

The Powerline utility is a free download available from the NETGEAR support website.

1. Launch a browser and visit:

http://support.netgear.com/app/products/model/a_id/19341

2. Scroll down to display the download instructions:


Installation Instructions:
Download using the button below and save the file to a convenient location such as the desktop.
Click here to download
X.XX MB
Run the file you just downloaded and follow the on-screen install instructions.

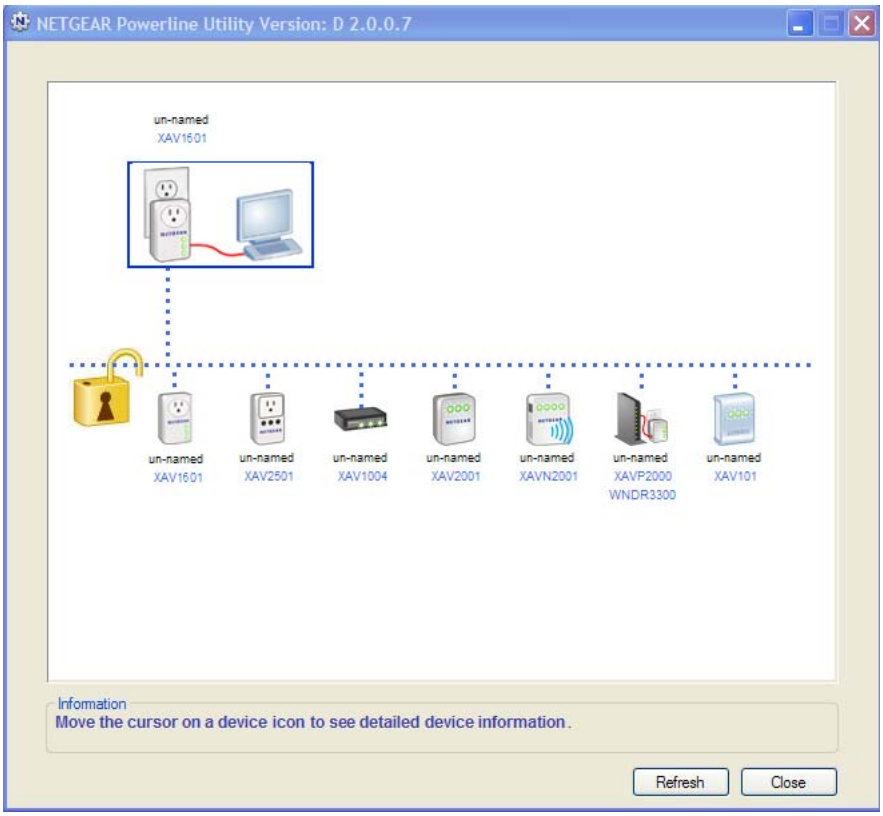
3. Click the **Click here to download** button and download the utility to your computer.
4. Run the file that you downloaded, and follow the wizard prompts to install the Powerline Utility.

The Powerline Utility shortcut icon appears on your desktop:

5. There are two ways to launch the Powerline Utility:
   - Click the Powerline Utility shortcut icon located on your desktop.
   - Navigate to **Start > Programs > NETGEAR > NETGEAR Powerline Utility**

Powerline Utility Screen

When launched, the Powerline Utility opens to a screen that shows all of the devices in your Powerline network. If all devices are not shown, click the **Refresh** button to detect all Powerline Adapters on your network.



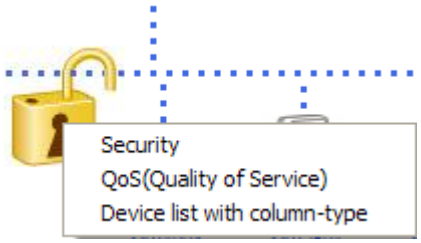
- Click the image of the device that you want to manage.
- If all devices are not shown, click the **Refresh** button to update the screen.
- The Information box at the bottom of the screen provides tips and information for using this utility page.

Security Icon

By clicking the Security icon on the Powerline Utility main screen, you can perform a number of security functions, such as:

- Setting up the network encryption key
- Setting Quality of Service (QoS)
- Viewing a list of Powerline devices in your Powerline network

When you click the **Security** icon , the following menu displays:



Return to the Default Network Encryption Key

1. Make sure your Powerline XAV1601 adapter is connected to an AC power outlet.
2. Start the XAV1601 Powerline Utility, click the **Refresh** button, and wait for the utility to detect the devices in your Powerline network.

> **Note:** Before you can reset a remote device, you must enter its password. The password is printed on the product label located on the back of the adapter.

3. Click the **Security** icon and select **Security** from the pop-up menu.
4. Check the box next to any Powerline device you want to return to the default Encryption Key.
5. Click the **Use Default Encryption Key** button.

   You will see the default encryption key, **HomePlugAV,** display in the encryption field.
6. Click **Apply Security to Selected Devices**.

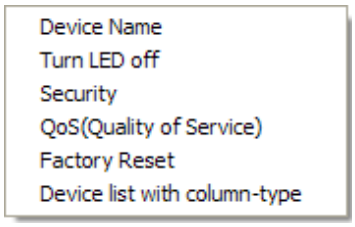
   When completed, the utility displays a message indicating that the operation was successful.
7. Click **OK**.

Change the Name of a Powerline Device

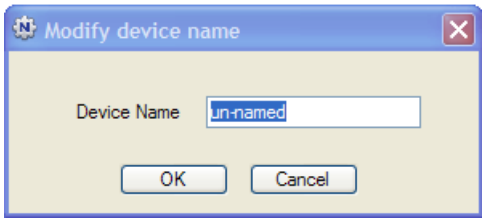
Powerline devices are shown in the Powerline network by the model number and name. Any Powerline devices that are plugged in and connected are detected by the Powerline Utility, and will be shown on the Powerline Utility main screen. If no name has been assigned to a Powerline device, the device is shown as *un-named*.

To name any Powerline device in your Powerline network:

1. From the Powerline Utility main screen, click the device you want to name, and the following pop-up menu appears:.



2. Click **Device Name**. The utility responds that connectivity will be temporarily lost if you continue.
3. Click **OK**. The following screen displays:



4. Enter a new name for the Powerline device, and click **OK**.

Turn LEDs On or Off

For each device in your Powerline network, you can turn LEDs on or off. To do this, follow these steps:

1. Click the Powerline device icon on the Powerline Utility main screen.
2. On the pop-up menu, click **Turn LED off**.

> **Note:** This function is a toggle. You can turn off LEDs if they are turned on, or turn them on if they are currently turned off.

A message displays advising you that connectivity will be temporarily lost while the LEDs are being reset.

3. Click **OK**, and the LEDs for the selected Powerline device are turned on or off.

Set the Powerline Encryption Key

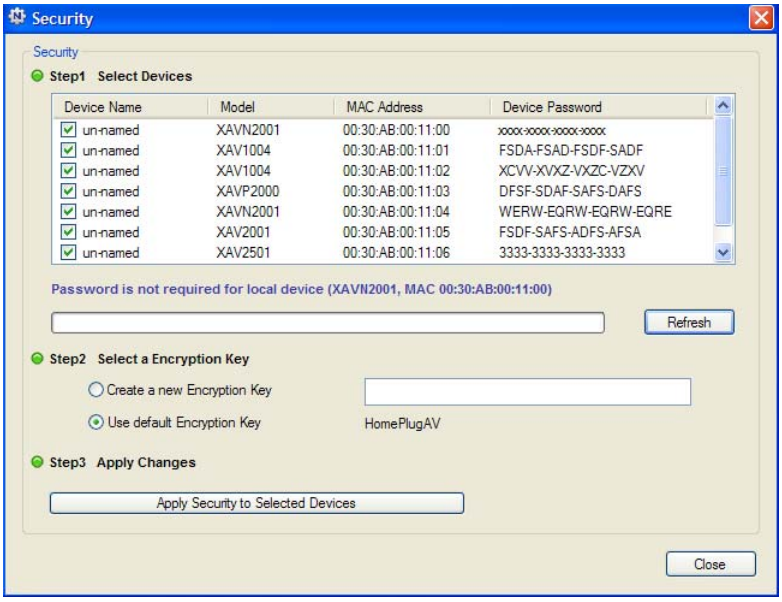
Powerline devices that share the same Powerline network have to use the same encryption key. The factory default encryption key is HomePlugAV.

In locations such as apartment complexes or office buildings, others might share the same electrical power lines that you use for your Powerline network. To protect your Powerline network from unwanted access, you can customize the encryption key for your Powerline devices. Make sure that you set up exactly the same encryption key for all of your Powerline devices so that they can communicate with each other.

You use the Security screen in the Powerline Utility to set encryption keys. If you customize the encryption key and then forget what it is, you can return your Powerline devices to the factory default Powerline encryption key, HomePlugAV.

To set the encryption key:

1. Click the Powerline device icon or the Security icon on the Powerline Utility main screen.



The top section of the Security screen shows information about each device that the Powerline Utility detects:

- **Device Name**. Lists the Powerline devices detected on the network after the utility completes a scan for devices. The device name is initially set by the utility, but you can change it to a descriptive name, such as Office or Master Bedroom.
- **Model**. Identifies the model number of the Powerline adapter.
- **MAC Address**. Shows the MAC address for the Powerline device, which is also on the product label, but may not be visible when the device is plugged in.
- **Device Password**. To change settings for a remote Powerline device, you have to enter its password. The device password is located on the product label.

2. Select the check box for each device for which you want to set encryption keys.
3. In Step 2 on your screen, select the option that you want:
   - **Create a new Encryption Key**. To set your own network encryption key, type your network encryption key in the field.
   - **Use the default Encryption Key**. When you click this button, the factory default encryption key automatically displays in the field. The default network encryption key is HomePlugAV.

> **Note:** Before you can reset the encryption key for a remote device, you have to enter its password. The password is printed on the product label located on the back of the Powerline adapter.

4. Click the **Apply Security to Selected Devices** button.

   When you are finished setting the encryption key, the utility displays a message indicating that the operation was successful.
5. Click **OK**.

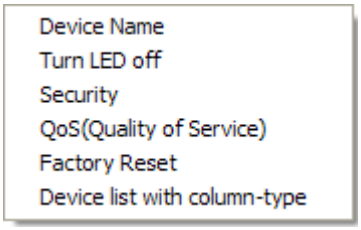
Reset a Device to Factory Settings

This option returns the network encryption key to its factory default of HomePlugAV.

> **Note:** If you customized your network encryption key, the local Powerline device is disconnected from the network when you set it to the factory default. To avoid this problem, reset all remote devices before you reset the local device.

To reset to factory defaults:

1. On the Powerline Utility main screen, click the Powerline device icon. The pop-up menu displays:



2. Select **Factory Reset**. A message displays asking you to confirm the reset.
3. Click **OK** to reset the device. A message indicates whether or not the operation succeeded.

Add a Device to a Powerline Network

If you are adding a device to a Powerline network, and the network encryption key has been left at its default setting, all you need to do is plug the new device into a power outlet.

If the network encryption key has been customized, there are two ways to set the security:

- You can use the Security button to add the new device to your network. See *Adding Adapters to Your Network* on page 9.
- You can use the XAV1601 Powerline Utility to add the new device to the network, as described in the following sections.

The procedure for setting the network encryption key depends on whether the computer running the XAV1601 Powerline Utility is connected directly to the new Powerline adapter (local) or is connected to a different device in the Powerline network (remote).

To add a device from a locally connected computer:

1. Plug the new Powerline adapter into an available AC power outlet.
2. Connect the Ethernet cable that came with the adapter to the adapter's Ethernet port and an Ethernet port on the computer.
3. Start the XAV1601 Powerline Utility, click the **Refresh** button, and wait for the utility to detect the new device.
4. From the Device Name column select the device.
5. Re-name the device if you wish (see *Change the Name of a Powerline Device* on page 15).
6. Set the device's **Security** option from the drop-down menu.
7. Click the **Apply Security to Selected Devices** button.
8. Click **Close**.

Verify that the devices in the Powerline network appear in the device list by clicking the **Refresh** button on the Powerline Utility main screen. It might take a minute or two for all devices in the network to be detected.

Set Up Quality of Service (QoS)

The Quality of Service (QoS) function helps you prioritize your Powerline network traffic.

By default, all types of traffic on the Powerline network are assigned the same priority. For most applications, this works fine. However, there are situations where performance improves if you assign a higher priority to certain types of traffic, such as multimedia files.

To prioritize by general application type:

If your network traffic is a mix of multimedia and document/database traffic you might want to give priority to a particular traffic type. If it is important that your multimedia playback is smooth, even while document files are being transferred over the network, then give priority to multimedia traffic. Conversely, if it is more important for your network to be responsive to database applications, give priority to this type of application over multimedia applications.

The Powerline AV Ethernet Adapter supports the following:

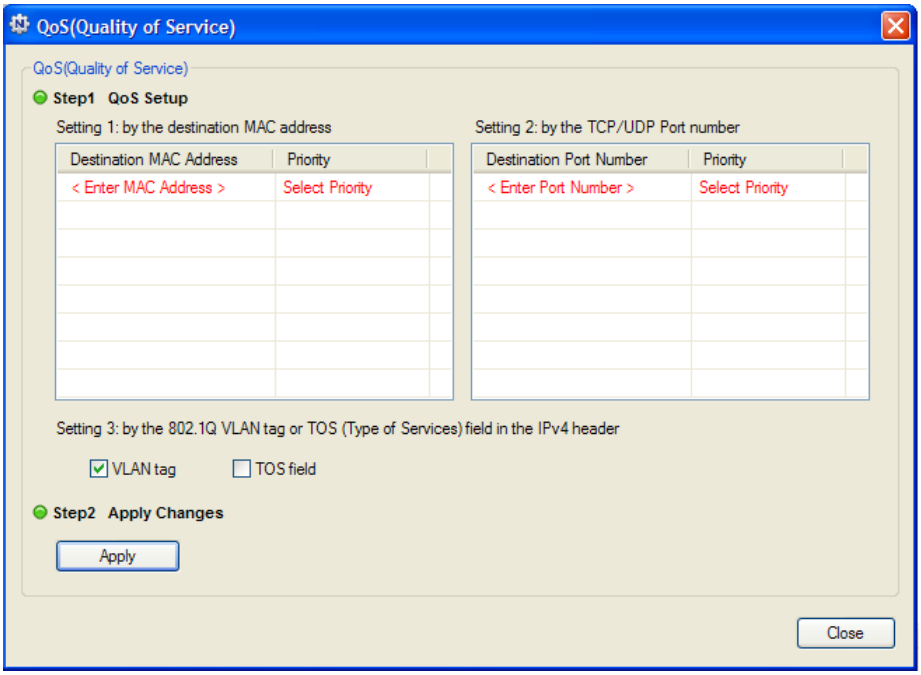
- MAC address
- IP port
- VLAN tags
- ToS bits (Type of Service routing)

To set the priority of data transfers by the type of protocol:

1. Start the XAV1601 Powerline Utility and wait for the utility to detect the Powerline AV Ethernet Adapters connected to the network.

   You can go to the QoS screen from either the Security icon menu or the Powerline device pop-up menu.

2. From the pop-up menu, click **QoS (Quality of Service).**



3. To set the traffic prioritization rule into the selected Powerline AV Ethernet Adapter device, specify the priority in the **QoS Setup** section of the screen.
4. Click **Apply**.

Note: QoS settings are applied only to the selected device.

These options only apply to QoS-configured business networks. IEEE 802.1p uses prioritization bits in Layer-2 frames. Type of Service routing (ToS) uses prioritization bits in Layer-3 IP packets. The deprecated ToS values range from 0 to 7.

Troubleshooting

3

This chapter provides information about troubleshooting your XAV1601 Powerline AV+ 200 Nano.

Product Registration and Support

Thank you for selecting NETGEAR products.

After installing your device, locate the serial number on the label of your product and use it to register your product at *http://www.netgear.com/register*. Registration is required before you can use our telephone support service. Registration via our website is strongly recommended.

Product updates and Web support are always available at: *http://support.netgear.com*.

Basic Functioning

After you turn on power to the XAV1601, the following sequence of events should occur:

1. When power is first applied, verify that the Power LED is on.
2. After approximately 10 seconds, verify that:
   a. The Power LED is solid green.
   b. The Powerline LED is lit.
   c. The Ethernet LED on the Powerline XAV1601 Nano lights or blinks.

LED Troubleshooting Tips

Table 1. LED and Feature Troubleshooting

Table 2.

Problem	Recommendation
Power LED is off.	Make sure that power is supplied to the electrical outlet, and the Powerline device is not plugged into an extension cord, power strip, or surge protector.
Power LED is amber.	The adapter enters power saving mode if the Ethernet port is not linked for more than 10 minutes. It goes back to normal mode when the Ethernet port is linked.
Powerline LED is off.	The Powerline devices cannot find each other. Make sure that the Powerline devices are plugged into outlets with power, and that they use the same network encryption key. • Move the Powerline device to a location closer to the computer or devices. • If you have set up network security, make sure that all Powerline devices are using the same encryption key. • If the problem occurred after you changed the network encryption key, reset each device to its factory default settings.
Ethernet LED is not blinking.	There is no data traffic. Make sure that: • Your router and modem are switched on. • The Ethernet cable that came in the box is working and securely connected to the Powerline adapter port and a router LAN port. • The PC connected directly to the router can access the Internet. • Press the **Reset** button on each device for 1 second to return the Powerline adapter to its factory default settings
Problem using the Reset or Security button.	The Factory Reset and Security buttons are located on the side panel of the Powerline AV Ethernet Adapter. • Pressing the **Reset** button longer than 2 seconds does not reset the device. • Pressing the **Security** button longer than 2 seconds does not activate security.
All LEDs are off when plugged into the AC line.	Use the Powerline utility to see if the LEDs are turned off via the software. If so, then use the Powerline utility to turn them back on.

Problems after Changing the Network Encryption Key

If your Powerline devices stop communicating after you have used the NETGEAR XAV1601 Powerline Utility, it is probably because the encryption key is not the same for every Powerline device on your Powerline network. To fix this problem:

1. Make sure all Powerline devices are plugged in.
2. Use the Powerline utility to set the encryption key for all remote Powerline devices (the ones that are not directly connected to the computer that you are using).
3. Use the Powerline utility to set the encryption key for the local Powerline device (the one that is connected to the computer you are using).

Supplemental Information

A

This appendix provides technical specifications and safety information for the XAV1601 Powerline AV+ 200 Nano.

Technical Specifications

Network Protocol and Standards Compatibility	
Data and routing protocols:	IEEE 802.3 (10BASE-T), IEEE 802.3u (100BASE-Tx)
AC input	100–240V~, 0.1A (Max)
Power consumption:	3W
Dimensions:	Height: 105 mm Width: 58 mm Depth: 41 mm
Weight:	0.4 lbs (0.189 kg)
Environmental Specifications	
Operating temperature:	0° to 40° C (32º to 104º F)
Operating humidity:	10–90% maximum relative humidity, noncondensing
Storage humidity	5–95% maximum relative humidity, noncondensing
Security	
Encryption type:	128-bit AES
Bridge Performance	
MAC addresses:	64
Powerline Performance	
Compatibility:	HomePlug AV
Data Transfer Rate:	Up to 200 Mbps PHY rate or 90 Mbps data transfer rate
Frequency band:	2 – 30 MHz

Modulation type:	OFDM symbol modulation
Electromagnetic Emissions	
Meets requirements of:	FCC Part 15 Class B; CE-EMC Class B; 3-home FCC Certificate; HomePlug AV, IEEE 1901
Safety Agency Approvals	
Meets requirements of:	UL Listed (UL 1950) /cUL IEC950; CE LVD; TUV CB; GS

Safety Information

Follow these safety guidelines to ensure your own personal safety and to help protect your system from potential damage.

- AC input: 100–240V~, 0.1A (Max).
- Operating temperature: 0C~40 degrees C.
- Actual data throughput will vary. Network conditions and environmental factors, including volume of network traffic, building materials and construction, and network overhead, lower actual data throughput rate.
- Observe and follow service markings.
- Do not service any product except as explained in your system documentation.
- Opening or removing covers that are marked with the triangular symbol with a lightning bolt may expose you to electrical shock. Only a trained service technician should service components inside these compartments.
- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your trained service provider:
  - The power cable, extension cable, or plug is damaged.
  - An object has fallen into the product.
  - The product has been exposed to water.
  - The product has been dropped or damaged.
  - The product does not operate correctly when you follow the operating instructions.
- Keep your system away from radiators and heat sources. Also, do not block cooling vents.
- Do not spill food or liquids on your system components, and never operate the product in a wet environment. If the system gets wet, contact your trained service provider.
- Do not push any objects into the openings of your system. Doing so can cause fire or electric shock by shorting out interior components.
- Use the product only with approved equipment.
- Allow the product to cool before removing covers or touching internal components.
- Operate the product only from the type of external power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult your service provider or local power company.

- To help avoid damaging your system, be sure that the voltage selection switch (if provided) on the power supply is set to match the power available at your location:
  - 110 volts (V), 60 hertz (Hz) in most of North and South America and some Far Eastern countries such as South Korea and Taiwan.
  - 100 V, 50 Hz in eastern Japan and 100 V, 60 Hz in western Japan.
  - 230 V, 50 Hz in most of Europe, the Middle East, and the Far East.
- Be sure that attached devices are electrically rated to operate with the power available in your location.
- To help prevent electric shock, plug the system and peripheral power cables into properly grounded electrical outlets.
- Use only approved power cables. If you have not been provided with a power cable for your system or for any AC powered option intended for your system, purchase a power cable that is approved for use in your country. The power cable must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cable should be greater than the ratings marked on the product.
- The peripheral power cables are equipped with three-prong plugs to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a cable.
- Observe extension cable and power strip ratings. Make sure that the total ampere rating of all products plugged into the extension cable or power strip does not exceed 80 percent of the ampere ratings limit for the extension cable or power strip.
- To help protect your system from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Position system cables and power cables carefully; route cables so that they cannot be stepped on or tripped over. Be sure that nothing rests on any cables.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications.
- Always follow your local and national wiring rules.
- Move products with care; ensure that all casters and stabilizers are firmly connected to the system. Avoid sudden stops and uneven surfaces.

Notification of Compliance

B

NETGEAR Powerline Products

Safety Instructions and Precautions

WARNING!

Use the following safety guidelines to ensure your own personal safety and to help protect your product from potential damage. To reduce the risk of bodily injury, electrical shock, fire, and damage to the equipment, observe the following precautions.

- The socket-outlet shall be installed near the equipment and shall be easily accessible
- Observe and follow service markings.
- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your service provider/retailer:
  - The power cable, extension cable, or plug is damaged.
  - An object has fallen into the product.
  - The product has been exposed to water.
  - The product has been dropped or damaged.
  - The product does not operate correctly when you follow the operating instructions.
- Keep your system away from radiators and heat sources. Also, do not block cooling vents.
- Do not spill food or liquids on your system components, and never operate the product in a wet environment
- Do not push any objects into the openings of your system. Doing so can cause fire or electric shock by shorting out interior components.
- Operate the product only from the type of external power source indicated on the electrical ratings label.
- Also, be sure that attached devices are electrically rated to operate with the power available in your location.
- Use only approved power cables. If you have not been provided with a power cable for your system or for any AC powered option intended for your system, purchase a power cable that is approved for use in your country. The power cable must be rated for the product and for the voltage and current marked on the product's electrical ratings label.

The voltage and current rating of the cable should be greater than the ratings marked on the product.

- To help prevent electric shock, plug the system and peripheral power cables into properly grounded electrical outlets.
- Do not use adapter plugs. If you must use an extension cable, use a three-wire cable with properly grounded plugs.
- Observe extension cable and power strip ratings. Make sure that the total ampere rating f all products plugged into the extension cable or power strip does not exceed 80 percent of the ampere ratings limit for the extension cable or power strip.
- To help protect your system from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Position system cables and power cables carefully; route cables so that they cannot be stepped on or tripped over. Be sure that nothing rests on any cables.
- Do not modify power cables or plugs.
- Always follow your local and national wiring rules.

Regulatory Compliance Information

This section includes user requirements for operating this product in accordance with National laws for usage of radio spectrum and operation of radio devices. Failure of the end-user to comply with the applicable requirements may result in unlawful operation and adverse action against the end-user by the applicable National regulatory authority.

This product's firmware limits operation to only the channels allowed in a particular Region or Country. Therefore, all options described in this user's guide may not be available in your version of the product.

FCC Requirements for Operation in the United States

FCC Information to User

This product does not contain any user serviceable components and is to be used with approved antennas only. Any product changes or modifications will invalidate all applicable regulatory certifications and approvals

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Guidelines for Human Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC Declaration Of Conformity

We, NETGEAR, Inc., 350 East Plumeria Drive, San Jose, CA 95134, declare under our sole responsibility that the Powerline AV+ 500 Adapter (XAV1601) complies with Part 15 of FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

FCC Radio Frequency Interference Warnings & Instructions

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following methods:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an electrical outlet on a circuit different from that which the radio receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications made to the product, unless expressly approved by NETGEAR, Inc., could void the user's right to operate the equipment.

Canadian Department of Communications Radio Interference Regulations

This digital apparatus, the XAV1601 Powerline AV+ 200 Nano, does not exceed the Class B limits for radio-noise emissions from digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

European Union

The XAV1601 Powerline AV+ 200 Nano complies with essential requirements of EU EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC as supported by applying the following test methods and standards:

- EN55022: 2006 / A1: 2007
- EN55024: 1998 / A1: 2001 / A2: 2003
- EN60950-1: 2006 2nd Edition
- EN 61000-3-2:2006
- EN 61000-3-3:1995 w/A1: 2001+A2: 2005

GPL License Agreement

GPL may be included in this product; to view the GPL license agreement go to *ftp://downloads.netgear.com/files/GPLnotice.pdf*.

For GNU General Public License (GPL) related information, please visit *http://kbserver.netgear.com/kb_web_files/open_src.asp*.

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